

Bare Standard
AAC/AAAC/ACSR
Conductors



Indo Alusys Industries Limited
SUPERIOR TECHNOLOGY - SUPERIOR SOLUTIONS



connect to experience change



INTRODUCTION TO OVERHEAD CONDUCTORS

In the line design process, the most crucial decision often involves selecting the phase and ground conductors. The selection of conductors is critical since wind and tension loads that supporting structures must withstand are type of conductors used.

Phase and ground conductors normally consist of multiple strands of aluminum, copper, and /or steel. Due to the stranding induced helical form of the individual strands, conductors exhibit lower composite rated breaking strength (4 to 11%), greater weight and higher resistance per unit length of conductor (2 to 4%) then would be obtained, were all the component wires parallel alone.

Selection of the conductor depends upon factors, such as power requirements, governmental and environmental constraints, strength and electrical resistance stress-strain relationship, thermal characteristics and inductive and capacitive reactance. Array of conductors ranging standard AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor have been developed to meet the varying needs of the electrical utility engineer.

CONDUCTOR MATERIALS

The most common type of phase conductors for overhead transmission lines is composed of strands of relatively pure aluminum; an aluminum alloy, and steel combined. Copper conductors are rarely used today because of their inferior conductivity-to-weight and strength-to-weight ratios and high costs.

- All Aluminum Conductors-ACC
- Aluminum Conductors Steel Reinforced-ACSR
- All Aluminum Alloy Conductors-AAAC
- Aluminum Alloy Conductors Steel Reinforced-AACSR
- Aluminum Conductors Alloy Reinforced-ACAR
- Aluminum Conductor Al. clad Steel Reinforced-ACSR/AS
- Copper Conductor-Single Wire & Stranded
- Insulated Conductor Strands-Copper/Aluminum



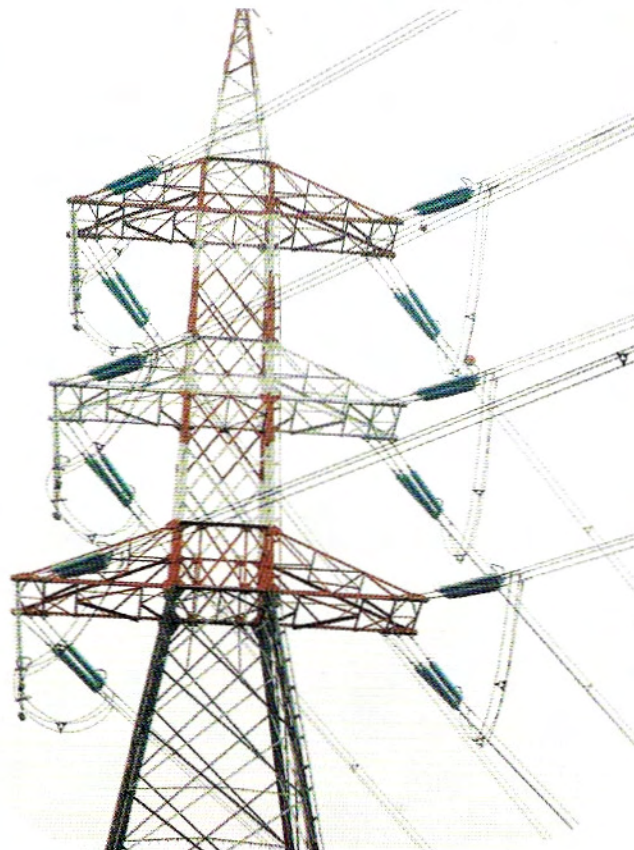


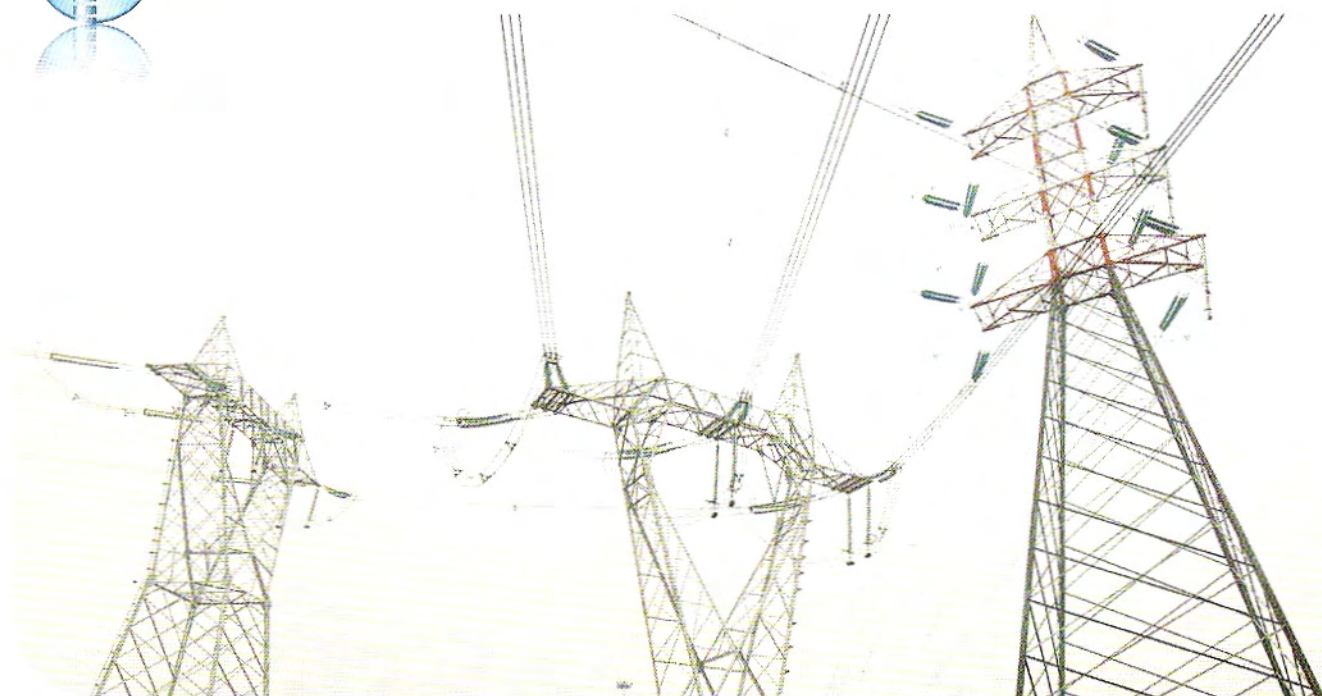
CONDUCTOR SELECTION

Tension loads, Wind loads, the current loading of the line, voltage stability, environmental affects losses, ambient conductions are all factors which must be considered to select a conductor. Selection should exemplify the best conductivity-to-weight ratio and/or strength-to-weight ratio at a minimal cost for the application. The electrical and mechanical properties, thermal properties, and stress-strain relationship of the conductor will dictate the choice of conductor type and size for a given design.

In short, there may be conductors which offer some advantages in a particular line condition corresponding to other, Power line engineer should drive a balance between the advantages vis a vis needs of the line design. The following factors should be considered.

- Lower electrical resistance resulting in higher conductivity
- Lower thermal elongation resulting in less sag
- Higher annealing temperatures allowing greater amp city
- Superior tensile strength for larger spans and lower creep
- Superior corrosion resistance top withstand all weather conditions
- Lower weight to withstand ice loading & wind induced Aeolian violations.
- Suitability for urban or rural usages.





THE INDO ALUSYS INDUSTRIES LIMITED is emerging as pioneer global provider of power transmission conductor-started manufacturing and marketing Bare Aluminum Conductors for Overhead Power Transmission & Distribution Lines in 2008 and has relentlessly marched forward, being currently one of the leading manufacturers of the same in India. Professionalism of the highest caliber, inspired vision and drive for product innovation contributed to the success of the business in a competitive market both in the domestic front and exports.

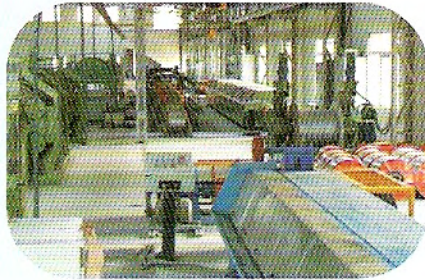
Within easy reach of the northern- Region has the manufacturing plants, located in the States of Rajasthan with present installed capacity for AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor & vast range of PVC / XLPE , Railway Signaling , Quad cable, Instrumentation cable & ABC Cables.

In very short span, the company has been consistently focusing to manufacture multi-stranded conductors of various sizes of AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor covering the entire range of high voltage transmission and distribution lines from 0.4 KV to 400 KV.

Apart in domestic market, the INDO ALUSYS will created a reputation for its AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor in overseas market too and will share in line with bulk exports of AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor by executing export orders for conductors. As we continue to accord our self focusing on developing new energy saver product to meet the upcoming demands of market.



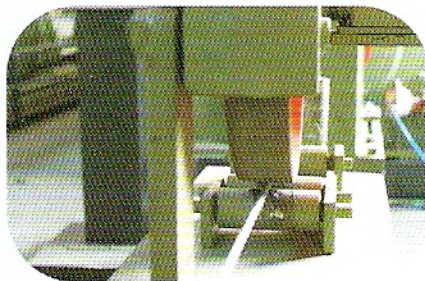
ART OF MANUFACTURING



Aluminum or Copper Wires are drawn from high conductivity wire rods and then stranded in high speed stranders for 7,12,18,24 layers of wires, one over the other. The configuration of Conductors manufactured will vary according to the requirements of the Customer.



Aluminum alloy based conductors are being AAAC, types are solution treated and aged in specialty furnaces to achieve the perfect match of high mechanical strength and electrical Conductivity.



The finished Conductors are supplied in stranded forms as per the length specified by the buyers or conforming to relevant standards in wooden drums or as per customer requirements.

STANDARD AND QUALITY CONTROL

The manufactured Bare Aluminum Conductor - AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor carries the Indian Standard Certification marks (ISI), ASTM/BS/CSA/JIS/DIN which guarantees good quality in marking strategy and has found full acceptance in domestic as well as foreign markets conforming to its equivalent standards for AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor.

The quality Strict in-process quality control is maintained at every stage of production from purchase or raw-material upto the finished product stage. A fully equipped team of Engineers and Sales Officers study individual Customer's requirements and offer free technical guidance on the choice and use of AAC, AAAC, ACSR, ACAR, ACSR, AACSR and COPPER Conductor.

Our continuous and systematic efforts to Achieve High Standards of Quality have been recognized with Award of ISO-9001-2000 Accreditation Certificate. The Company is managed by highly qualified technicians & professionally competent managers to sustain the high standards of efficiency & quality standards.



RESEARCH, DEVELOPMENT & STRATEGY

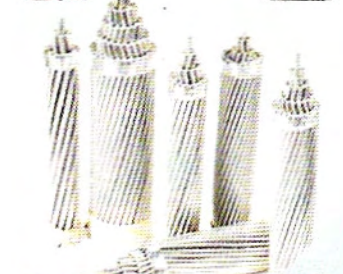
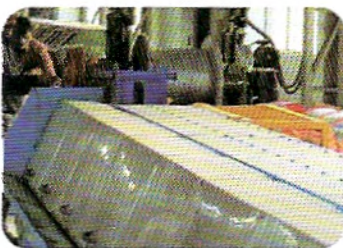
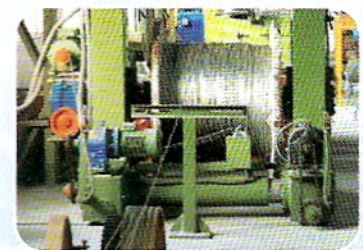
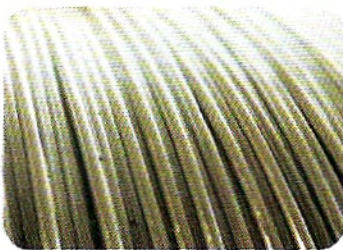
More than its products, it is the strict adherence to high quality and on time deliveries that has brought the Company the name as reliable Supplier, which has helped not only to capture new markets but also winning appreciation from different Customers of the World. The Company has a Research & Development set up backed by sophisticated testing facilities which would enable development of advanced electrical conductor and wire products.

Now in its operation, INDO ALUSYS is poised for further growth backed by the proven expertise, experience, and commitment to high quality and delivery schedule. Export Market Sales would also show remarkable growth in forthcoming years and look forward to meet specific needs of Conductors in building of Power Transmission and Distribution Lines. Strongly dedicated to power sector, INDO ALUSYS is coming up with up gradation of latest art of plant & machinery at its most sophisticated plant.



PRODUCT RANGE

- AAC, ACSR, ACAR, ACSR, AACSR CONDUCTORS UPTO 400 KV
- ALL ALUMINIUM ALLOY CONDUCTOR UPTO 400 KV
- COPPER CONDUCTOR & OTHER SPECIAL CONDUCTORS AS PER CUSTOMER'S REQUIREMENT.



STRANDARD BARE ALUMINIUM CONDUCTOR (AAC) IS-398-I : 1976

Code word	Nominal Aluminium Area	Stranding	Sectional Area	Approx. Overall Diameter	Approx. weight	Calculated Resistance at 20°C. (Max)	Approx. Calculated breaking Load	Copper equivalent
	Sq. mm.							
Gnat	25	7/2.21	26.85	6.63	74	1.086	4.52	16
Ant	50	7/3.10	52.83	9.30	1.45	0.5525	8.25	32
Wasp	100	7/4.39	106.00	13.17	290	0.2752	15.96	64
Special Conductor	150	19/3.18	150.90	15.90	415	0.1942	23.28	92
Spider	240	19/3.99	237.60	19.95	654	0.1235	35.74	145
Buttrfly	300	19/4.65	322.70	23.25	888	0.09107	48.74	196

STRANDARD BARE ALUMINIUM CONDUCTOR STEEL REINFORCED (ACSR) IS-398-II : 1976 & IS : 398-V : 1992

Code word	Nominal Aluminium Area Sq. mm.	Stranding Nos./mm		Sectional Area Sq. mm.		Approx. Overall Diameter mm	Approx. weight Kg/Km Total	Calculated Resistance at 20°C (Max) Ohm/Km	Approx. Calculated breaking Load KN	Copper equivalent Sq. mm.		
		Alum	Steel	Alum	Steel							
Mole	10	6/1.50	1/1.50	10.60	12.37	4.50	43	29	14	2.781	3.97	6
Special Conductor	18	6/1.96	1/1.96	18.10	21.12	5.88	73	50	23	1.618	6.74	11
Squirrel	20	6/2.11	1/2.11	20.98	24.48	6.33	85	58	27	1.394	7.61	12
Weasel	30	6/2.59	1/2.59	31.61	36.88	7.77	128	87	41	0.9291	11.12	19
Rabbit	50	6/3.35	1/3.35	52.88	61.70	7.77	128	87	41	0.9291	11.12	19
Raccoon	80	6/4.09	1/4.09	78.83	91.97	12.27	319	217	102	0.3712	26.91	48
Dog	100	6/4.72	7/1.57	105.00	118.50	14.15	394	288	106	0.2792	32.41	64
Wolf	150	30/2.59	7/2.59	158.10	194.90	18.13	726	438	288	0.1872	67.34	96
Panther	200	30/3.00	7/3.00	212.10	261.50	21.00	974	587	387	0.1391	89.67	129
Kundah	400	42/3.50	7/1.96	404.10	425.20	26.88	1281	1120	161	0.07347	88.79	246
Zebra	420	54/3.18	7/3.18	428.90	484.50	28.62	1621	1187	434	0.06870	130.32	261
Moose	520	54/3.53	7/3.53	528.50	597.00	31.77	2004	1465	539	0.05552	161.20	322
Markulla	560	42/1.13	7/2.30	562.70	591.70	31.63	1787	1559	228	0.0599	120.16	343
Bersimis	690	42/4.57	7/2.54	688.90	724.40	35.04	2187	1907	280	0.04242	146.87	420

STRANDARD BARE ALUMINIUM CONDUCTOR STEEL REINFORCED (ACSR) BS-215-11-1970

Code word	Conductor Size Sq.mm.	Stranding Nos./mm Sq. mm.	Sectional Area		Overall Diameter mm	Approx. weight Kg/Km		Ultimate Strength Kg.	Calculated Resistance at 20°C(Max) Ohm/Km	Copper equivalent Sq. mm.		
			Aluminium	Steel		ACSR	Aluminium				Steel	
Gopher	25	6/2.36	1/2.36	26.24	30.62	7.08	106	72	34	980	1.093	16
Weasel	30	6/2.59	1/2.59	31.61	36.88	7.77	128	87	41	1,170	0.9077	19
Fox	35	6/2.79	1/2.79	36.68	42.80	8.37	148	101	47	1,340	0.7822	22
Ferret	40	6/3.00	1/3.00	42.41	49.48	9.00	172	117	55	1,550	0.6766	25
Rabbit	50	6/3.35	1/3.35	52.88	61.70	10.05	214	145	69	1,870	0.5426	32
Mink	60	6/3.66	1/3.66	63.17	72.64	10.98	255	173	82	2,220	0.4546	38
Horse	70	12/2.79	7/2.79	73.37	116.20	13.95	538	203	335	6,240	0.3936	45
Dog	100	6/4.72	7/1.57	105.00	118.50	14.15	394	288	106	3,330	0.2733	64
Coyote	130	26/2.54	7/1.91	131.70	151.80	15.89	521	364	157	4,730	0.2191	80
Wolf	150	30/2.59	7/2.59	158.10	194.90	18.13	726	437	289	7,060	0.1828	96
Lynx	175	30/2.79	7/2.79	183.40	226.20	19.53	842	507	335	8,140	0.1576	112
Panther	200	30/3.00	7/3.00	212.10	261.50	21.00	974	586	388	9,430	0.1363	129
Jaguar	200	18/3.86	1/3.86	210.60	222.30	19.30	671	580	91	4,750	0.1367	128
Goat	320	30/3.71	7/3.71	324.30	400.00	25.97	1,489	896	593	13,850	0.08912	193
Bison	380	54/3.00	7/3.00	381.70	431.20	27.00	1,443	1,055	888	12,330	0.07574	225
Zebra	400	54/3.18	7/3.18	428.90	484.50	28.62	1,622	1,186	436	13,450	0.06740	258
Deer	425	30/4.27	7/4.27	429.60	529.80	29.89	1,973	1,187	786	16,210	0.06727	262
Moose	525	54/3.53	7/3.53	528.50	597.50	31.77	1,998	1,461	537	16,420	0.05470	322

STRANDARD BARE ALL ALUMINIUM ALLOY CONDUCTORS
IS : 398-V : 1994

Actual Area	Stranding and Wire Dia	Approx. Overall Dia	Approx. Mass	Calculated Resistance at 20°C (max)	Approx. Calculated Breaking Load
mm ²	mm	mm	Kg/Km	Ohm/Km	KN
15	3/2.50	5.39	40.15	2.3040	4.33
22	7/2.00	6.00	60.16	1.54010	6.45
34	7/2.50	7.50	94.00	0.9900	10.11
55	7/3.15	9.45	149.20	0.6210	16.03
80	7/3.81	11.43	218.26	0.4250	23.41
100	7/4.26	12.78	272.86	0.3390	29.26
125	19/2.89	14.45	342.51	0.2735	36.64
148	19/3.15	16.75	406.91	0.2290	43.50
173	19/3.40	17.00	474.02	0.1969	50.54
200	19/3.66	18.30	549.40	0.1710	58.66
232	19/3.94	19.70	636.67	0.1471	58.56
288	37/3.15	22.05	794.05	0.1182	84.71
346	37/3.45	24.15	952.56	0.0984	101.58
400	37/3.71	25.97	1101.63	0.0829	117.40
465	37/4.00	28.00	1280.50	0.0734	136.38
525	61/3.31	29.79	1448.39	0.0651	146.03
570	61/3.45	31.05	1573.71	0.0598	158.66
604	61/3.55	31.95	1666.00	0.0568	167.99
642	61/3.66	32.94	1771.36	0.0534	178.43
695	61/3.81	34.29	1919.13	0.0492	193.25
767	61/4.00	36.00	2115.54	0.0446	213.01

STRANDARD BARE ALL ALUMINIUM ALLOY CONDUCTOR

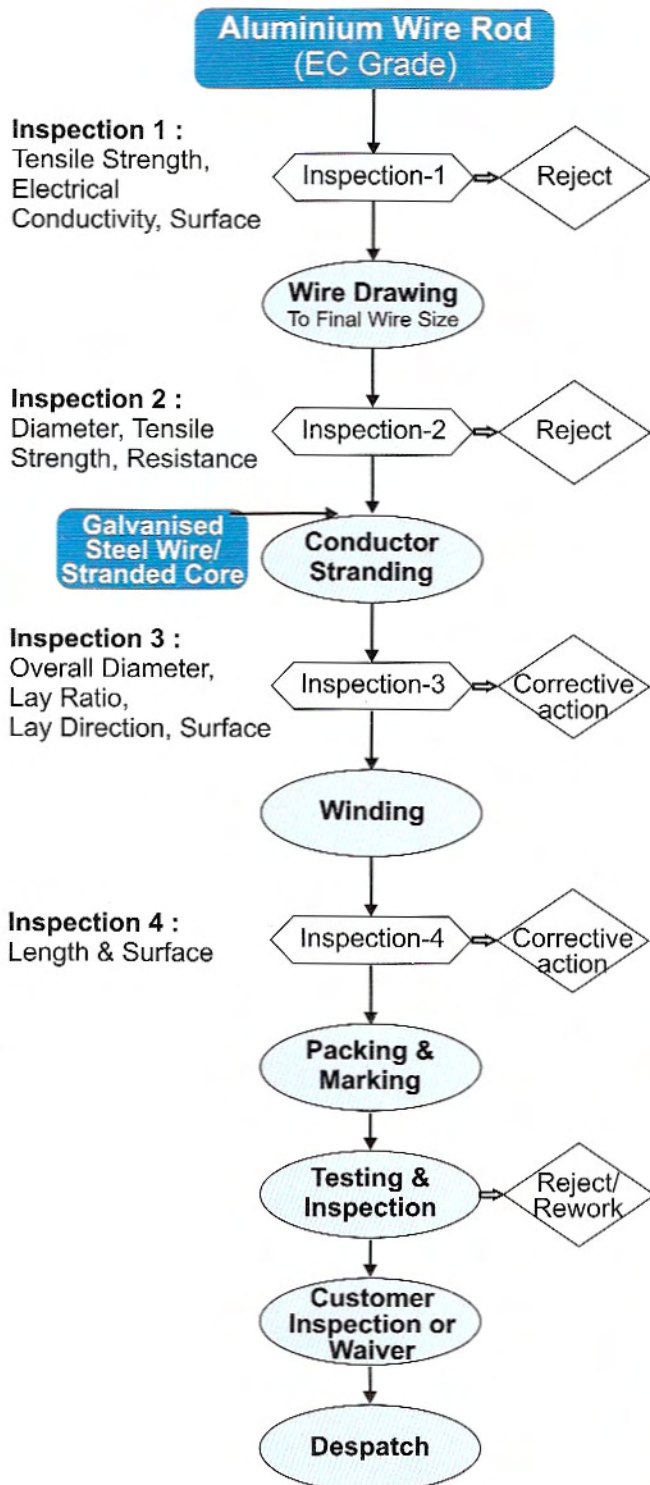
Code Word	Nominal Aluminium Area	Stranding	Sectional Area	Overall Diameter	Approx. weight	Calculated Breaking load	Calculated Resistance at 20°C
	Sq.mm.	No/mm	Sq.mm.	mm	Kg/Kmmm	KN	Ohm/Km
Almond	25	7/2.34	30.10	7.02	82	8.44	1.094
Cedar	30	7/2.54	35.47	7.62	97	9.94	0.9281
Fir	40	7/2.95	47.84	8.85	131	13.40	0.6880
Hazel	50	7/3.30	59.87	9.90	164	16.80	0.5498
Oak	100	7/4.65	118.9	13.95	325	33.30	0.2769
Ash	150	19/3.48	180.7	17.40	497	50.65	0.1830
Elm	175	19/3.76	211.0	18.80	580	59.10	0.1568
Upas	300	37/3.53	362.1	24.71	997	101.50	0.09155

STRANDARD BARE ALUMINIUM ALLOY (AAAC) CONDUCTOR
ASTM - B - 399 - 1992

Conductor Size	Stranding and Wire Dia	Sectional Area	Approximate Overall Dia	Approximate Mass	Calculated Resistance at 20°C (max) ohm/km	Rated Strength KN	Class
	No/mm	Sq. mm.	mm	Kg/Km			
MCM 30.58	7/1.68	15.52	5.04	43	2.163	4.93	A
MCM 48.69	7/2.12	24.71	6.36	68	1.356	7.84	A
MCM 77.47	7/2.67	39.19	8.01	108	0.8540	12.5	A
MCM 123.30	7/3.37	62.44	10.11	172	0.5371	19.8	AA, A
MCM 155.40	7/3.78	78.55	11.34	217	0.4259	24.0	AA, A
MCM 195.7	7/4.25	99.30	12.75	274	0.3376	30.2	A
MCM 246.9	7/4.77	125.10	14.31	345	0.2677	38.1	A
MCM 312.8	19/3.26	158.59	14.30	437	0.2113	48.4	AA, A
MCM 394.5	19/3.66	199.90	18.30	551	0.1677	59.0	AA
MCM 465.0	19/3.98	236.38	19.90	650	0.1421	69.6	AA
MCM 559.5	19/4.36	283.67	21.80	781	0.1181	83.6	AA
MCM 652.5	19/4.71	331.05	23.55	911	0.1014	97.5	AA
MCM 740.8	37/3.59	374.53	25.13	1034	0.0892	108	AA
MCM 927.2	37/4.02	469.62	28.14	1295	0.0712	136	AA
MCM 1077.4	61-/3.38	545.90	30.42	1495	0.0613	156	AA
MCM 1165.1	61/3.51	590.30	31.59	1617	0.0568	169	AA
MCM 1259.6	61/3.65	638.40	32.85	1748	0.0526	182	AA
MCM 1348.8	61/3.78	683.40	34.02	1872	0.0490	195	AA
MCM 1439.2	61/3.90	729.20	35.10	1997	0.0461	208	AA

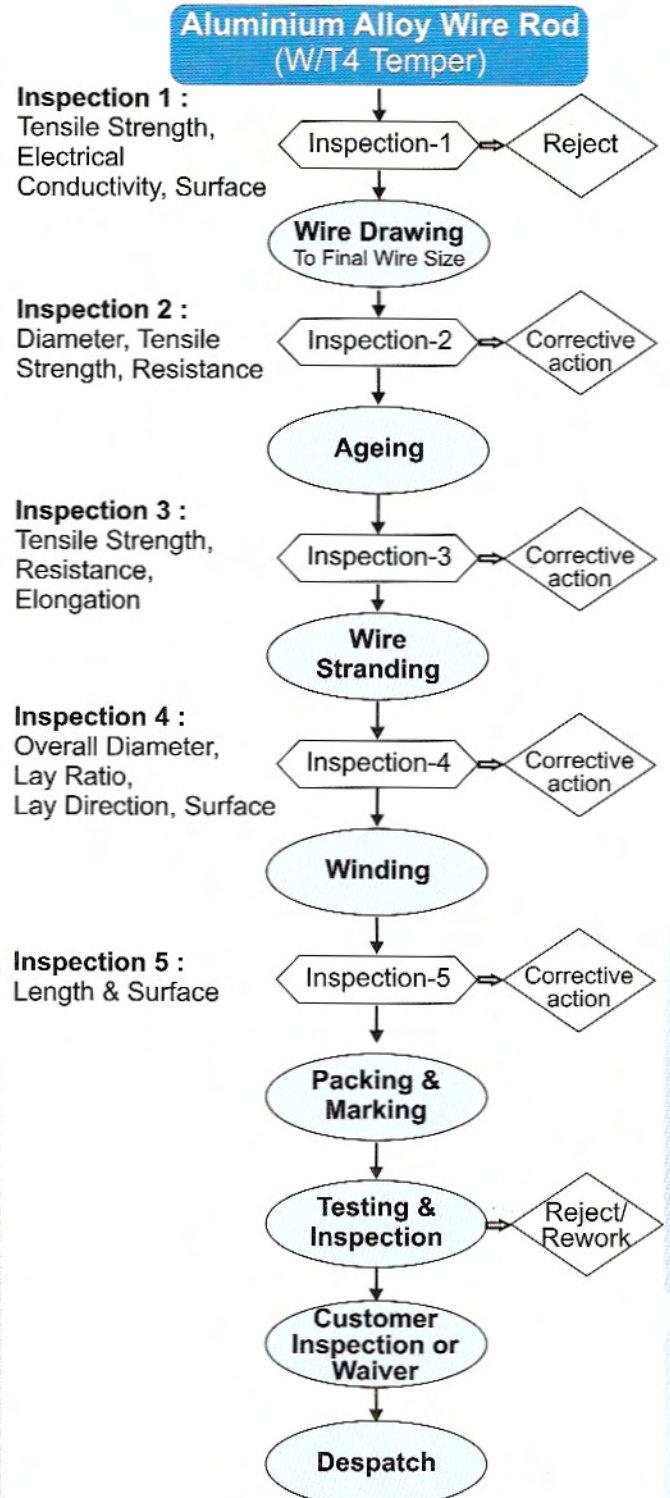
PROCESS FLOW CHART

ACSR CONDUCTOR

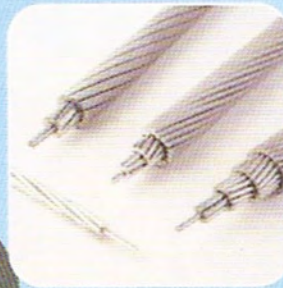
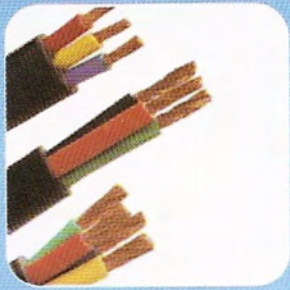


↓ Indicates inspected & ACCEPTED

AAA CONDUCTOR



⇒ Indicates inspected & NOT ACCEPTED



Indo Alusys Industries Limited

SUPERIOR TECHNOLOGY - SUPERIOR SOLUTIONS

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